

## EDIBLE FISHES OF QUEENSLAND.

## PART III.—CARANGIDÆ (No. 1).

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(Plates XIX-XXVIII.)

As this paper deals with a part only of this large and important family, it is unnecessary to give any particulars at this stage, further than to say that so far as is known about 45 species occur in our waters, of which the following ten are described and figured below:—

1. DECAPTERUS RUSSELLII, p. 59, Pl. XIX.
2. ALEPES KALLA, p. 62, Pl. XX.
3. CARANX SPECIOSUS, p. 67, Pl. XXII.
4. CARANGUS BUCCULENTUS, p. 73, Pl. XXI.
5. CITULA GRACILIS, p. 75, Pl. XXIII.
6. CITULA CHRYSOPHRYS, p. 77, Pl. XXIV.
7. CITULA AUROCHS, p. 79, Pl. XXV.
8. ALECTIS INDICA, p. 83, Pl. XXVI.
9. ALECTIS CILIARIS, p. 88, Pl. XXVII.
10. TRACHINOTUS BOTLA, p. 93, Pl. XXVIII.

*Note*:—For the purpose of facilitating an analysis of all the information acquired with regard to the geographical distribution of our fishes, I propose, in this and all succeeding papers, to divide Queensland into three zoological districts as follow:—

## SOUTH QUEENSLAND (S.Q.).—

Embracing all the coastline between the mouth of the Tweed River (our natural boundary) and the Tropic of Capricorn, the islands and reefs outlying therefrom, and the hinterland to the South Australian and Northern Territory Marches; having Brisbane as its metropolis, and Moreton Bay (Brisbane River), Wide Bay (Great Sandy Strait and Mary River), Hervey Bay (Burnett River), and Port Curtis (Calliope River) as its principal inlets.

## MIDDLE QUEENSLAND (M.Q.).—

Extending in similar fashion from the Tropic to latitude 20° S., with Rockhampton as its chief city, and Keppel Bay (Fitzroy and Dawson Rivers), Shoalwater Bay, Broad Sound, Pioneer River, Repulse Bay (Proserpine River), and Edgecumbe Bay (Don River). And

## NORTH QUEENSLAND (N.Q.).—

Comprising York Peninsula and the Gulf of Carpentaria, with their respective islands, reefs, rivers, and hinterlands south to the twentieth parallel.

The following abbreviations will be employed throughout the work:—

A.M., Australian Museum; B.I., British India; B.N.G., British New Guinea; B.R., Barrier Reef; D.N.G., Dutch New Guinea; M.Q., Middle Queensland; N.Q., North Queensland; N.S.W., New South Wales; N.T., Northern Territory; O.C., Old Collection; Q.M., Queensland Museum; S.A., South Australia; S.Q., South Queensland; Tas., Tasmania; T.S., Torres Strait; Vic., Victoria; W.A., West Australia; W.I., West Indies.

We take this opportunity of thanking Miss Phyllis Clark of Sydney for the evident care which she has taken in the production of the admirable drawings which illustrate this paper; also to Mr. Allan R. McCulloch for many valuable suggestions.

#### DECAPTERUS Bleeker.

*Decapterus* Bleeker, Nat. Tijds. Nederl. Ind., i, 1851, p. 352<sup>1</sup> (*kurra*); Jordan & Evermann, Fish. North & Mid. Amer., pt. 1, 1896, p. 907.

*Eustomatodus* Gill, Proc. Acad. Nat. Sci. Phila., 1862, p. 261 (*kurroides*).<sup>2</sup>

*Gymnepignathus* Gill, ibid. (*macrosoma*).

*Evepigymnus* Gill, ibid. (*hypodus*).

Body elongate-elliptical to elongate, subfusiform. Scales small and cycloid, covering the whole body except the nuchal ridge. Lateral line feebly curved, consisting of enlarged scales throughout its entire length, those on the straight section wholly or in part spinigerous. Head moderate or large, compressed, with pointed snout, the cheeks, temples, and occiput mostly scaly. Mouth terminal, protractile, with rather small oblique cleft, the jaws equal or the lower slightly projecting; maxillary rather short, strongly dilated distally, with well developed supplemental bone. Dentition feeble; teeth in the jaws minute, mostly in a single series; similar teeth on the vomer and the palatines, and usually on the tongue. Nostrils small and contiguous. Eyes large, lateral, median or nearly so, with well developed adipose lid. Spinous dorsal well developed, persistent, with 7 to 9 flexible spines; soft dorsal and anal lobes low, each succeeded by a single pinnule, the former with 27 to 36, the latter with 23 to 30 soft rays; free anal spines strong. Caudal small and narrowly forked. Pectoral moderate and falcate, with 21 to 23 rays. Ventrals moderate, originating below the pectoral-base. Gill-rakers rather long and slender. (δέκα, ten; πτερόν, a fin: the pinnulæ being reckoned as separate fins, but the two anals as one.)

Small scombriform trevallies, frequenting nearly all temperate and tropical seas. At least 20 species are recognised as valid. In all probability two other species of *Decapterus*—*D. leptosomus*<sup>3</sup> and *D. muroadsi*<sup>4</sup>—occur on our coast,

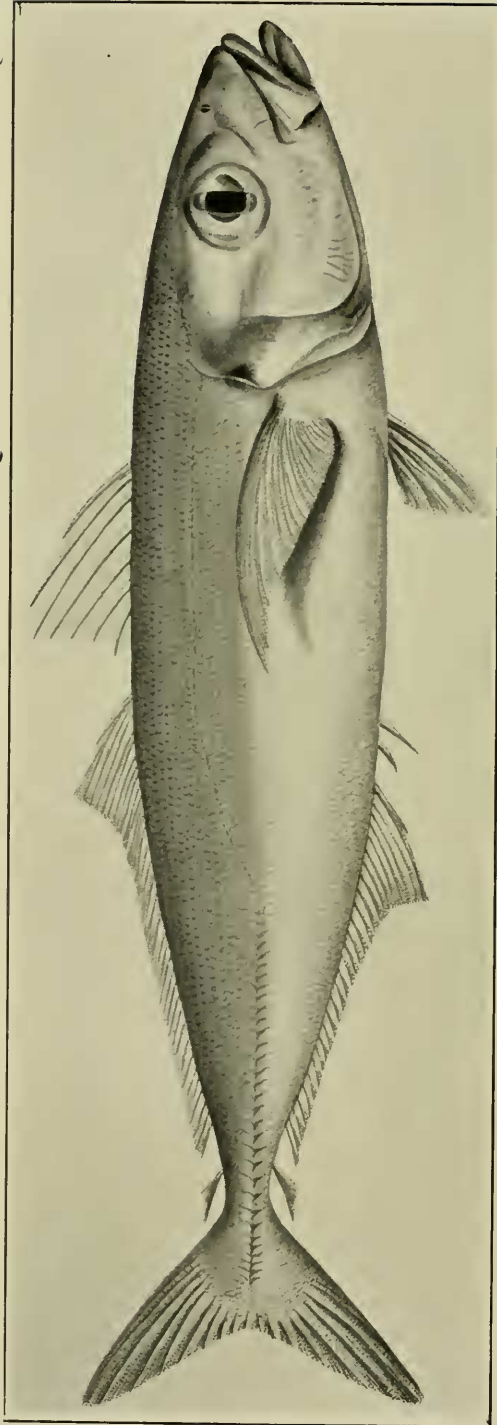
<sup>1</sup> Since it has been proved that *russellii* (= *kurra*) possesses lingual teeth this subgenus becomes merged in *Decapterus*.

<sup>2</sup> Authors have conspired to take Bleeker's paper in Verh. Batav. Gen., xxiv, 1852, as the earliest exposition of his carangin genera (except *Uraspis* 1855), and Jordan, Evermann, and Waite have even quoted it as "*Decapterus* 1855" (idd. supra and Rec. Austr. Mus., v, 1904, p. 199), but the paper quoted above antedates both these diagnostic keys.

<sup>3</sup> Ogilby, Proc. Linn. Soc. N. S. Wales, xxii, p. 761.

<sup>4</sup> *Carana muroadsi* Schlegel, Faun. Japon., Pisc., p. 108.





DECAPTERUS RUSSELLII (Rüppell).  $\frac{2}{3}$  Nat. Size.

*Phyllis Clarke del.*



and we, therefore, give the following key to enable observers to distinguish them when captured, in the hope that they will forward specimens to the Queensland Museum.

- a*<sup>1</sup>. Lateral line with less than 30 scutes, the straight section only partly armed.  
*b*<sup>1</sup>. Upper jaw with a series of small teeth . . . . . *muroadsi*.  
*b*<sup>2</sup>. Upper jaw toothless . . . . . *leptosomus*.  
*a*<sup>2</sup>. Lateral line with 35 scutes or more, the straight section armed throughout . . *russellii*.

#### DECAPTERUS RUSSELLII (Rüppell).

*Kurra Wodagawah* Russell, Fish. Vizagapatam, ii, 1803, p. 30, pl. exxxix.

*Caranx russellii* Rüppell, Atlas Fisch. Roth. Meer., 1828, p. 99; Boulenger, Proc. Zool. Soc. London, 1887, p. 660.

*Caranx kurra* Cuvier & Valenciennes, Hist. Nat. Poiss., ix, 1833, p. 44 (*after Russell*); Jerdon, Madras Journ. Lit. & Sci., 1851, p. 137; Günther, Brit. Mus. Catal. Fish., ii, 1860, p. 427; Day, Proc. Zool. Soc., 1865, p. 24; id., Fish. Malabar, 1865, p. 81; Klunzinger, Verh. zool.-bot. Ges. Wien, 1871, p. 453; Day, Fish. India, pt. 2, 1876, p. 214, pl. xlvi, fig. 5.

*Caranx pseudopterygius* Bleeker, Journ. Ind. Arch., iii, 1849, p. 71.

*Decapterus kurra* Bleeker, Nat. Tijds. Nederl. Ind., i, 1851, p. 358; id., *ibid.*, ii, 1851, p. 213; id., Verh. Batav. Gen., xxiv, 1852, Makreel, p. 50; id., *ibid.*, xxv, 1853, Bengal, p. 44; id., Nat. Tijds. Nederl. Ind., viii, 1855, p. 203; id., Act. Soc. Sei. Indo-Neerl., viii, 1860, Celebes, p. 39; Jordan & Richardson, Check-List. Fish. Philipp. Archip., 1910, p. 19.

*Caranx eclipsifer* de Vis, Proc. Linn. Soc. N. S. Wales, ix, pt. 3, 29 Nov., 1884, p. 541.

*Decapterus russelli* Jordan and Snyder, Proc. U. S. Nat. Mus., xxiii, 1901, p. 352; Steindachner, Denk. Akad. Wien, lxxi, 1902, p. 20; Smith and Pope, Proc. U. S. Nat. Mus. xxxi, 1907, p. 465.

*Decapterus* ? *eclipsifer* Ogilby, Proc. Roy. Soc. Queensl., xxiii, 1911, p. 9.

*Decapterus russellii* Ogilby, Mem. Queensl. Mus., ii, 1914, p. 90.

#### RUSSELL'S MACKEREL-SCAD.

(Plate XIX.)

*Type localities*:—Red Sea at El Tor (*C. russellii*).

Vizagapatam (*C. kurra*).

Celebes (*C. pseudopterygius*).

Cape York, N.Q. (*C. eclipsifer*).

Body elongate-elliptical and subfusiform, the dorsal and ventral contours symmetrical, its width 1.3 to 1.5 in its depth, which is 4.45 to 4.9 in its length and 1.3 to 1.45 in the length of the head; abdominal region long, 1.2 in the length of the anal, including the free ray; caudal peduncle about one eighth wider than deep, its width 1.67 in the eye-diameter. Head bluntly trigonal, its upper profile feebly convex and gently acclivous, its length 3.35 to 3.45 in that of the body, its width 1.2 to 1.3 in its depth, which is 1.55 to 1.7 in its length; cranio-nuchal keel moderately developed. Eye large, with a well developed adipose lid, which overlaps the pupil both in front and behind, its diameter 3.65 to

3.75 in the length of the head and 1.33 in that of the snout; interorbital region convex, its width 1.15 in the eye-diameter. Lower jaw projecting; maxillary strongly dilated, not quite extending to the vertical from the anterior border of the eye, its length 2.85 to 3 in that of the head, the width of its concave distal extremity one fourth to two fifths more than its distance from the eye and 2.33 to 2.4 in the eye-diameter. Angle of preopercle feebly crenulate.

Teeth in the jaws minute, forming a villiform patch anteriorly but reduced to a single series laterally; a diamond-shaped patch of larger teeth on the head of the vomer, the lateral angles of which are somewhat produced, and which is followed on the shaft by a single series of decrescent teeth; palatines and tongue each with a narrow band of villiform teeth.

Cheeks, postorbital and parietal regions, and upper part of opercle wholly, occiput and interorbital region partly scaly, the two latter with three naked bands, a median extending from between the nostrils to the nape, and a lateral pair each extending from behind a nostril to the occiput, where it bifurcates, the outer branch bent downwards across the parietal to finally merge in the lateral line, the inner, which is again divided, uniting with the median band where it enters the occiput and again at its tip; each band and its branches carries a pinnated mucous canal. Lateral line forming a long shallow curve to below the 11th or 12th dorsal ray, the curved section about one fourth longer than the straight, which is armed with 32 or 33 moderately strong keeled scutes, the widest about 1.9 in the eye-diameter.

Dorsal fin with viii, i 31 i rays, originating above the basal fourth of the appressed pectoral; procumbent spine small, concealed; spinous dorsal high, the spines flexible, the 3rd longest, half the length of the head. Soft dorsal originating a little nearer to the root of the caudal than to the tip of the snout, the anterior seven rays graduated and but little produced, the 1st ray 1.3 to 1.4 in the longest spine and 8.9 to 9.5 in the body-length; pinnula much longer than the last connected ray and split to its base. Caudal fin small and widely forked, the lobes obtusely pointed, its length 5.25 in that of the body. Anal with ii, i 25 to 27 rays, originating below the 6th or 7th dorsal ray; free spines strong, 1st the longer, 1.67 to 2.1 in the eye-diameter and 2 to 2.2 in the longest ray, which is 2.8 to 3.1 in the length of the head; pinnula similar to that of the dorsal. Pectoral with 21 to 23 rays, its length 3.8 to 4.1 in that of the body; 5th ray longest, extending to above or slightly beyond the vent. Ventral moderate, 1.9 to 2 in the length of the pectoral and 2.2 to 2.3 in that of the head; 2nd ray longest, reaching midway to the base of the 1st free spine.

Gill-rakers slender and moderately long, 5 + 31 or 32 on the anterior arch, the longest 1.35 in the gill-fringes and 6.75 to 7 in the length of the head. Vent close to the free anal spines, its distance from the anal 3.1 to 3.5 in that from the origin of the ventral.

Upper surface dark blue to glaucous, shading harmoniously on the sides into the iridescent silver of the breast and abdomen; axillary spot absent or small, but the hinder base of the pectoral blackish. Snout, anterior part and edges of interorbital region and borders of cranial grooves blackish; a black opercular spot. Fins hyaline, the soft dorsal, caudal, and pectorals stained with yellow. (Named after Dr. Patrick Russell, an early student of Indian ichthyology and author of the "Fishes of Vizagapatam.")

Described from two specimens, each 245 millim. long, one of which was collected at Darnley Island by Dr. J. R. Tosh and presented by him to the Queensland Museum, the other the property of the Amateur Fishermen's Association of Queensland, by whom it, along with others hereafter mentioned, was kindly lent to us for the purpose of this Review; it was taken by hook in Moreton Bay.

*Historical*:—The earliest notice of this fish is to be found in Russell's "Fishes of Vizagapatam," where it is described and figured under a native name, which is variously spelt "Wodagawah" and "Wodagahwah." Of his description and figure little need be said, except that he failed to find the scales on the sides of the head, the 7th branchiostegal ray, and the lingual teeth, while the figure is much too deep. From Russell's time nothing was heard of the species until 1828, when Rüppell claimed to have obtained a single example from El Tor, a town on the Red Sea littoral near Mount Sinai, which he described in his Atlas under the name here adopted. Five years later Valenciennes, though well aware of Rüppell's action and though he had never seen a specimen of the fish, gave a new name to Russell's figure, and until lately this name has been in general use. Bleeker in 1849 again described it as new from Celebes; two years later he selected it by its Valenciennian name as the type of his new genus *Decapterus*. In his description of *D. kurra* he makes no mention of the dentition, but Günther in 1860 follows Russell in asserting that the tongue is edentulous; he had, however, only a half-grown example in such bad condition that his description, with the exception of the part dealing with the dentition, is a translation of Bleeker's, while the dentition itself may well have been copied from Russell. Be this as it may Day is certainly correct in stating that there is a band of teeth along the middle of the tongue as described above. Finally, in 1884, the first example recorded from Australian waters was described as new from Cape York by de Vis.

*Range*:—From the Red Sea through those of India and the Malay Archipelago to Eastern Queensland. With us in South Queensland it is certainly scarce, but we have handled two examples from Moreton Bay, the one, above referred to, caught by Mr. Chris. Dahl, the other by Mr. Matt. Colclough. The only other Queensland localities are Cape York and Darnley Island, the latter being at present the limit of its easterly range. From Malaysia Bleeker obtained it at Ternate, Celebes, and Java, while American collectors have extended its

range through the Philippines northward to Southern Japan. Its westerly limit has already been stated, but it may be mentioned that Steindachner's specimen came from Socotra.

*Dimensions*:—On the Indian Coast Day reports it as being “a small species attaining six or seven inches in length,” and adds that “it arrives in Madras about October.” Bleeker's largest specimen was under eight inches (195 millim), but on our coast it grows to at least 245 millim.

*Remarks*:—Our two specimens agree perfectly with Bleeker's description and, therefore, omitting his faulty dentition, with Günther's. There are, however, some discrepancies between Day's description and ours, chiefly with regard to the proportional size of various parts of the head; for instance, the depth of the head is said by him to be “four fifths of its length,” while in both of ours it is, excluding the throat, exactly two thirds of its length; again the eye is smaller in proportion to the head in his specimens than in ours, although the latter are the larger fishes, a reversal of normal conditions, nevertheless it is said to be as long as the snout. McCulloch has, however, kindly compared our Darnley Island specimen with an Endeavour fish from Bustard Bay, and with Indian specimens in the Australian Museum, and writes that “the only difference appears to be in the dorsal and anal fins, the Australian specimens having two more rays in each than the Indian ones.” *Caranx ecclipsifer* de Vis is certainly this fish, but, as is too often the case with that writer's specimens, the type is missing.

*Illustration*:—Our figure is taken from the Darnley Island specimen mentioned above. Reg No. in the Queensland Museum, I. 13/998.

#### **ALEPES KALLA** (Cuvier and Valenciennes).

*Caranx kalla* Cuvier & Valenciennes, Hist. Nat. Poiss., ix, 1833, p. 49; Day, Fish. Malabar, 1865, p. 83; id., Fish. India, pt. 2, 1876, p. 219, pl. xlix, fig. 5.

*Selar kalla* Bleeker, Verh. Batav. Gen., xxv, 1853, Bengal, p. 44.

*Caranx calla* Günther, Brit. Mus. Catal. Fish., ii, 1860, p. 433; Bleeker, Nederl. Tijds. Dierk., iv, 1873, p. 131; Macleay, Proc. Linn. Soc. N. S. Wales, iv, 1879, p. 63; Jordan & Richardson, Bull. U. S. Bur. Fisher., xxvii, 1908, p. 250; id., Check-List Philipp. Fish., 1910, p. 20.

*Micropteryx queenslandiæ* de Vis, Proc. Linn. Soc. N. S. Wales, ix, pt. 3, 29 Nov. 1884, p. 541.

*Caranx nigripinnis* Jordan & Seale, Bull. U. S. Bur. Fisher., xxvi, 1907, p. 14. Not of Day.

#### HERRING TREVALLY.

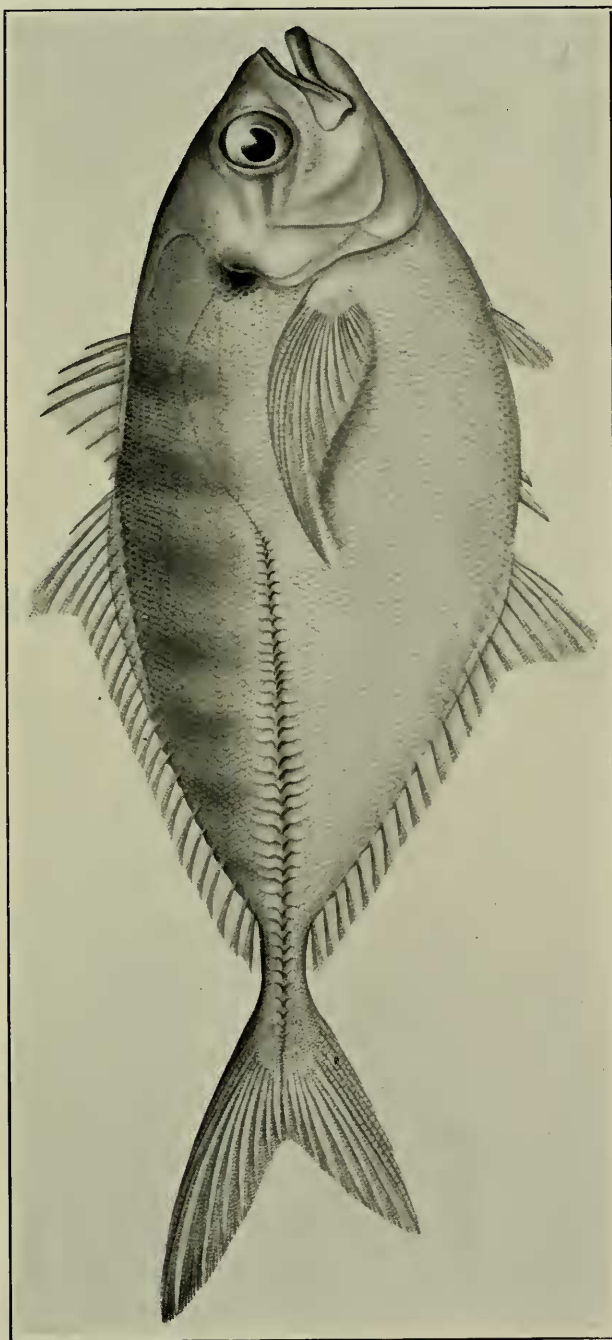
(Plate XX.)

*Type localities*:—Pondicherry (*C. kalla*).

Coast of Queensland (*M. queenslandiæ*).

Body. ovate, tapering posteriorly, the ventral contour much more arched than the dorsal, which is gently rounded from the occiput to the peduncle, that





ALEPES KALLA (Cuvier & Valenciennes). Nat. Size.

*Phyllis Clarke, del.*









of the ventral being strongly convex and bluntly cultriform between the isthmus and the anal fin; width of body 2.8 to 3 in its depth, which is 2.33 to 2.5<sup>5</sup> in its length and three fifths to three fourths more than the length of the head; abdominal region short, its length 1.65 to 1.8 in that of the anal; caudal peduncle very slender, considerably deeper than wide, its width 2.25 to 2.5 in the eye-diameter. Head small, its upper profile moderately acclivous, evenly convex in small examples, becoming linear with increasing age, its length 3.95 to 4.1 in that of the body, its width 1.7 to 1.85 in its depth, which is subequal to its length; cranio-nuchal keel inconspicuous. Snout short and blunt, its length 1.33 to 1.45 in the eye-diameter, which is 2.8 to 2.95 in the length of the head; adipose lid narrow in front, moderately developed but not reaching the pupil behind; interorbital region low and gently convex, its width 1.15 to 1.25 in the eye-diameter. Jaws subequal in small examples, the lower prominent in the larger; maxillary extending to below the anterior border of the pupil, its length 2.4 to 2.45 in that of the head, the width of its convex distal extremity 1.8 to 2.1 times its distance from the eye and 2.15 to 2.25 in the eye-diameter. Preopercular border entire.

Jaws with a single series of small conical teeth; similar teeth in a triangular patch on the head of the vomer, in a narrow band on the palatines, and in a broader band on the tongue.

Entire body except the nuchal ridge covered with rather large conspicuous scales; cheeks and temples scaly, the rest of the head naked; preopercle crossed by numerous simple or bifid mucous canals; nuchal canal conspicuous and pinnated, extending to the procumbent spine. Lateral line forming a short and rather high curve to below the 4th or 5th dorsal ray, the length of the curved section 1.8 to 1.95 in that of the straight, which is armed throughout with 41 to 45 wide keeled scales, the widest 1.1 to 1.25 in the eye-diameter.

Dorsal fin with viii, i 25 or 26 rays<sup>6</sup>; spinous dorsal moderate, originating behind the pectoral-base, procumbent spine small and concealed; spines weak and flexible, the 3rd longest, 2.15 to 2.25 in the length of the head. Soft dorsal originating one fourth nearer to the tip of the snout than to the root of the caudal, the anterior six rays graduated and but little produced, the 1st longest, about two fifths longer than the 3rd spine, 6.25 to 6.6 in the body-length, and extending when depressed to the 9th ray; last ray not produced. Caudal fin deeply and rather widely forked, the upper lobe the longer, its length 3.4 to 3.67 in that of the body. Anal fin with ii, i 21 or 22 rays, originating below the 4th dorsal ray<sup>7</sup>; free spines well developed, the 2nd much the longer, 1.3 to 1.5 in the eye-diameter and 1.9 to 2.1 in the 1st ray, which is 2 to 2.1 in the length of the head. Pectoral with 21 rays, its length 3.45 to 3.15 in that of the body and from one fifth to two sevenths more than the length of the head; 5th ray longest,

<sup>5</sup> Writing of 43 examples McCulloch says—"they vary greatly in depth, two specimens of equal size being 2.4 and 2.8 in length."

<sup>6</sup> As has been remarked elsewhere there is a tendency among Australian specimens towards an increase in the number of dorsal and anal rays.

<sup>7</sup> In Day's figure the soft dorsal and anal originate opposite one another.

reaching to above the 5th or 6th anal ray. Ventral small and rounded, 2.66 to 3.2 in the length of the pectoral and 9.2 to 10.1 in that of the body; 2nd ray longest, reaching the vent.

Gill-rakers long and slender, 8 to 6 + 28 to 30 on the anterior arch, the longest 1.2 in the gill-fringes and 5.5 in the length of the head. Vent one half nearer to the origin of the ventrals than to the anal.

Blue above, shading into bronze on the upper side, the lower side and breast silvery. Upper surface of head, snout, and tip of mandible bronze; a large blackish shoulder-spot, encroaching well on the upper edge of the opercle; sides and lower surface of head, a blotch on the throat, and the bases of the pectoral, ventral, and anal fins washed with dull gold. Fins hyaline, except the anterior dorsal spines and the outer ray and tip of the upper caudal lobe, which are blackish. (*kalla*; the Tamil name for this species.)<sup>8</sup>

Described from three specimens, measuring respectively 152, 160, and 176 millim., trawled off the Coast of Middle Queensland during the winter of 1910. The largest and smallest are in the Queensland Museum, the other in that of our Amateur Fishermen's Association, by whom it was kindly lent at our request. We have also examined the type of *Micropteryx queenslandiæ* de Vis, which is certainly this species.

*Vernacular name*:—There being no trivial name, local or otherwise, for this trevally, we have been obliged to coin the above, which was suggested by its extraordinary resemblance in general form to some of our species of *Sardinella*.

*Historical*:—The earliest notice of this singular carangid will be found in the "Histoire Naturelle des Poissons," in which Valenciennes describes it from Pondicherry, a French settlement on the Coromandel Coast of India, where it was known by the Tamil name of "*kalla paré*," or "*kalla parah*" as Day prefers to write it. Valenciennes also declares that he had seen specimens sent from Mahé on the Malabar Coast by Bélenger and Dussumier, as well as others in the Geoffroyan collection from the Red Sea; it is, however, strange, if the latter locality be correct, that it should have so entirely escaped the notice of such keen observers as Rüppell, Klunzinger, Kossmann, and other historians of that well explored area. He also mentions incidentally that Bloch's collection contained an example without locality, which was labelled *Scomber bimaculatus*, but of which no description seems to have been published. In 1851 Bleeker described as new from Batavia a closely allied species, to which he gave the name *Scelar brevis*, and which is said to differ from *S. kalla* principally in having the dorsal and ventral contours symmetrical and the curve of the lateral line shorter, terminating below instead of well behind the origin of the soft dorsal. Günther in 1860 accepted this species as valid, but Day, sixteen years later, challenged its validity, referring it as a synonym to *S. kalla*. Apparently, however, Jordan, Richardson, and Seale, having examined specimens of both forms from the Philippines, have convinced themselves of their specific value, and we,

<sup>8</sup> McCulloch (*in lit.*) remarks—"a few specimens retain traces of about six vertical bars from the back downwards.

therefore, follow them in keeping the species separate. It remains, then, to discuss the status of the two Valenciennian species *Caranx para* and *C. cambon*. Günther characteristically evades the responsibility by relegating them to the unattached list, but Day suggests that they may be identical with *C. kalla*, and it must be allowed that an examination of Valenciennes' descriptions favours the suggestion.<sup>9</sup>

*Range*.—Seas of India, China, and Malaysia, eastward to the Coast of Queensland and perhaps to the Solomon Islands; it was also reported to have been taken in the Red Sea during the early part of the last century, but there has been no subsequent confirmation of the report, which must, therefore, be considered doubtful. It is not included in Surgeon-Major Jayakar's collections made at Maskat, on the Arabian shore of the Gulf of Oman.<sup>10</sup> Nor is it much in evidence in our home waters, de Vis' specimen in fact, which formed the type of his *Micropteryx queenslandia*, being for twenty-six years unique; this specimen bears all the marks of Broadbent's collecting, and is, therefore, certain to have come from either Cairns or Somerset. In 1910, the "Endeavour" was, however, so fortunate as to come across it on two separate occasions during its second trip along the Queensland coast: firstly, off Pine Peak, where 46 examples were trawled on mud at a depth of 25 fathoms, and secondly, in Edgumbe Bay, the trawl on this occasion accounting for 6 specimens taken on fine sand and mud in 14 fathoms. Passing to the north-east Macleay recorded it doubtfully from the Solomon Islands, but it is not included in Jordan and Seale's list of the Pacific Islands' Fishes. Turning now to the west we are confronted with the curious fact that, while the American collectors found it to be not uncommon at the Philippines, neither Bleeker nor Cantor ever received it from any part of the Malay Archipelago, though the former knew it from Bengal. The British Museum, however, possesses a specimen from Sumatra and another from the Moluccas, besides several from the Chinese Coast. It is generally distributed along the eastern shores of India and round Ceylon, but to the westward we have no evidence of its presence beyond the Malabar Coast.

As regards the Archipelago the identification of *C. para* and *C. cambon* with our species at once relieves the situation, for Bleeker claims to have received

<sup>9</sup> If this be correct the synonymy will have to be amended by the addition of the following:—

*Caranx para* Cuvier & Valenciennes, p. 58; Bleeker, Nederl. Tijds. Dierk., ii, 1865, p. 173; Day, Fish. Malabar, 1865, p. 85.

*Caranx cambon* Cuvier & Valenciennes, *ibid.*, p. 60; Bleeker, Nat. en Geneesk. Arch. Ned. Ind. ii, 1845, p. 517; *id.*, Verh. Batav. Gen., xxii, 1849, Madura, p. 4; *id.*, *ibid.*, xxiii, 1850, Mid. en Oost Java, p. 8.

*Scler para* Bleeker, *ibid.*, xxiv, 1852, Makreel, p. 56; *id.*, *ibid.*, xxv, 1853, Bengal, p. 44; *id.*, Nat. Tijds. Nederl. Ind., xii, 1856, p. 214; *id.*, *ibid.*, xvi, 1858, p. 407; *id.*, *ibid.*, xviii, 1859, p. 367; *id.*, Aet. Soc. Sci. Indo-Neerl., viii, 1860, Sumatra, p. 30 & Celebes, p. 39.

*Type localities*.—Malabar Coast (*C. para*); Batavia (*C. cambon*).

<sup>10</sup> See Boulenger, Proc. Zool. Soc. London, 1887, pp. 653 to 667; *ibid.*, 1889, pp. 236 to 246, and *ibid.*, 1892, pp. 134 to 136.

them respectively from Sumatra, Nias, Singapore, Banca, Java, and Celebes (*para*) and Java and Madura (*cambon*).

*Dimensions*:—It is rather difficult to say to what size this species really grows; of the 52 examples obtained by the "Endeavour" the largest does not exceed 190 millim. Valenciennes notes the length of his specimens as to about 300 millim., while Day complicates the matter by stating in 1865 that it attains a length of over 600 millim., but eleven years later reduces that measurement by two thirds, without making any explanation of the discrepancy. Probably Valenciennes' computation may be taken as the most correct.

*Illustration*:—Taken from a Queensland specimen, 182 millim. in length, now in the State Museum. Reg No. I. 14/2233.

### CARANX (Commerson MS.) Lacépède.

*Caranx* (Commerson MS.) Lacépède, Hist. Nat. Poiss., iii, 1802, p. 57 (*speciosus*).

*Gnathanodon* Bleeker, Nat. Tijds. Nederl. Ind., i, 1851, p. 352 (*speciosus*).

*Hypocaranx* Klunzinger, Fisch. Roth. Meer., 1884, p. 93 (*speciosus*).

Body subovate to ovate, compressed. Scales small and cycloid, covering the whole body except the nuchal ridge. Lateral line with a long and gentle curve, the scutes few and weak. Head rather large, compressed, with convex profile and long rounded snout, the cheeks, temples, and occiput mostly scaly. Mouth terminal, protractile, with moderate oblique cleft, the upper jaw the longer; maxillary rather short, dilated distally, its upper edge covered by the membranous border of the preorbital; supplemental bone well developed. Young with minute teeth, which wholly disappear with age. Nostrils small and contiguous. Eyes small, lateral, median, the adipose lid little developed. Preopercle entire, the border membranous. Spinous dorsal low, with 8 feeble spines, some of which are absorbed in the adult; soft dorsal and anal with moderate equal lobes, the former with 18 to 21, the latter with 15 to 17 soft rays; anal spines small. Caudal deeply and widely forked. Pectoral long and falcate, with 22 rays. Ventrals moderate, originating below lower angle of pectoral-base. Gill-rakers well developed and rather stout, in moderate number. (From the French name "*carangue*," which is said to be a corruption of the Portuguese "*acarana*."<sup>11</sup>)

Fishes of moderate size, inhabiting the warmer waters of the Indian and Pacific Oceans. Two, perhaps three, species recognisable.

The main differences between *C. rüppellii* and *C. speciosus* are as follow:—

- a<sup>1</sup>. Head about 4 in total length; maxillary extending to below anterior border of eye or not quite so far . . . . . *speciosus*.  
 a<sup>2</sup>. Head about 5.67 in total length; maxillary extending to below or beyond middle of eye . . . . . *rüppellii*.<sup>12</sup>

<sup>11</sup> Similarly our vernacular name "trevally" is undoubtedly a corruption of the Spanish "erevallé."

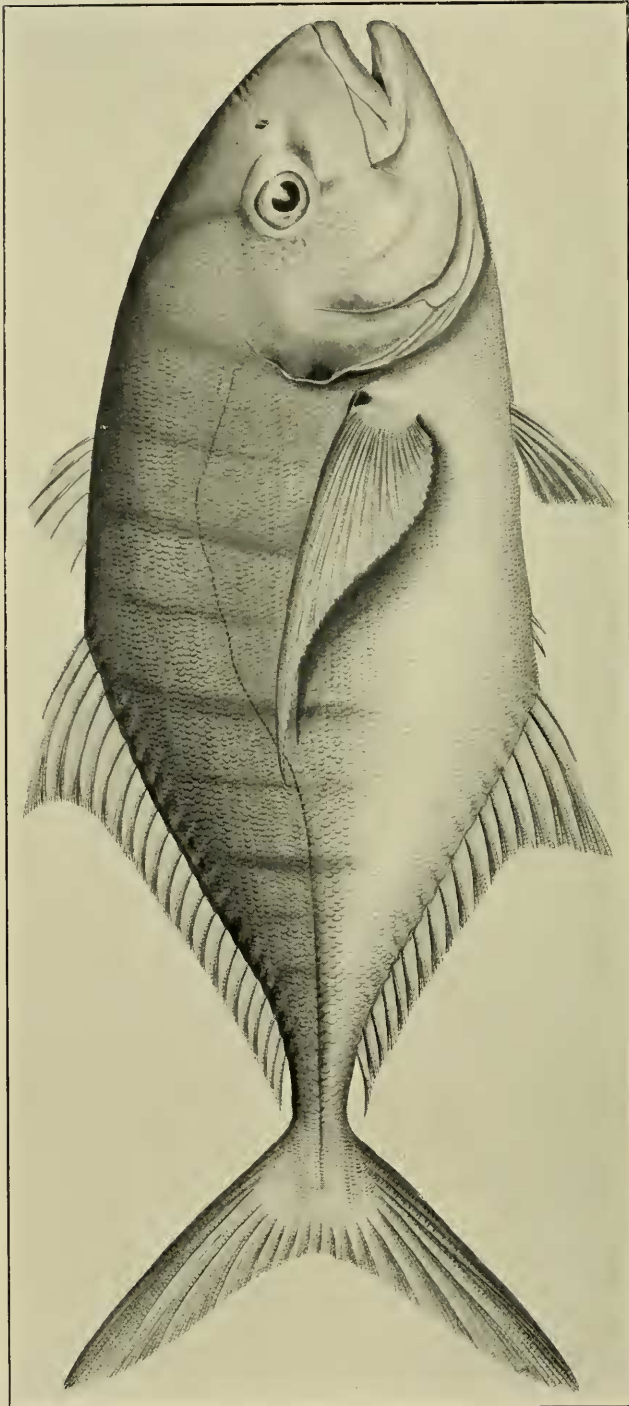
<sup>12</sup> Günther, Brit. Mus. Catal. Fish., ii, 1860, p. 445 = *C. petaurista* Rüppell, Atlas Fisch. Roth. Meer., 1828, p. 95, pl. xxv, fig. 2. Not of Geoffroy.











CARANX SPECIOSUS (Forsk.). ♂ Nat. Size.

*Phyllis Clarke, del.*

The latter species should be diligently sought for in other waters than the Red Sea whence both it and *C. speciosus* were originally described, for it seems incredible that of two so closely allied species, one should have elected to remain permanently in its narrow home waters, while the other, with no visible superiority in its favour, has succeeded in spreading over two oceans.

### CARANX SPECIOSUS (Forsk.)

*Scomber speciosus* Forskal, Deser. Anim., 1775, p. 54; Bonnaterre, Encycl. Méth., Ichth., 1788, p. 143; Gmelin, Linnæus, Syst. Nat., ed. 13, i, 1789, p. 1332; Shaw, Gen. Zool., iv, 1804, p. 603.

*Caranx speciosus* (Commerson MS.) Lacépède, Hist. Nat. Poiss., iii, 1802, p. 72, pl. i, fig. 1; Cuvier & Valenciennes, Hist. Nat. Poiss., ix, 1833, p. 130; Bleeker, Nat. en Geneesk. Arch. Nederl. Ind., ii, 1845, p. 517; Richardson, Zool. Erebus & Terror, ii, 1848, Ichth., p. 136; Bleeker, Verh. Batav. Gen., xxii, 1849, Madura, p. 4; id., ibid., xxiii, 1850, Mid. en Oost Java, p. 8; Cantor, Catal. Malayan Fish., 1850, p. 133; Jerdon, Madras. Journ. Lit. & Sci., 1851, p. 137; Peters, Arch. f. Nat., 1855, i, p. 245; Günther, Brit. Mus. Catal. Fish., ii, 1860, p. 444; Day, Fish. Malabar, 1865, p. 84; id., Proc. Zool. Soc. London, 1865, p. 25; Playfair, Proc. Zool. Soc. London, 1867, p. 860; Günther, Trans. Zool. Soc. London, vi, 1869, p. 431; Day, Proc. Zool. Soc. London, 1870, p. 689; Klunzinger, Verh. zool.-bot. Ges. Wien, 1871, p. 455; id., Sitz. Akad. Wien, lxxx, i, 1879, p. 377; Macleay, Proc. Linn. Soc. N. S. Wales, v, 1881, p. 535; id., ibid., vii, 1882, p. 356; Jordan & Gilbert, Proc. U. S. Nat. Mus., v, 1882, p. 375; Boulenger, Proc. Zool. Soc. London, 1887, p. 661; id., 1889, p. 240; Jordan & Evermann, Amer. Food & Game Fish., 1902, p. 308; Jenkins, Bull. U. S. Fish. Comm., xxii, 1903, p. 447; Snyder, Bull. U. S. Fish. Comm., xxii, 1904, p. 525; Jordan & Evermann, Bull. U. S. Fish. Comm., xxiii, pt. 1, 1905, p. 197; Waite, Rec. Austr. Mus., vi, 1905, p. 71; Jordan and Seale, Bull. U. S. Bur. Fish., xxv, 1906, p. 232; id., ibid., xxvi, 1907, p. 14; Seale & Bean, Proc. U. S. Nat. Mus., xxxiii, 1908, p. 241; Jordan & Richardson, Mem. Carnegie Mus., iv, No. 4, 1909, p. 179.

*Polooso-Parah* Russell, Fish. Vizagapatam, ii, 1803, p. 36, pl. exlix.

*Caranx petaurista* I. Geoffroy, Deser. Egypt, 1809, Poiss., p. 325, pl. xxiii, fig. 1.

*Zonichthys subcarinata* Swainson, Nat. Hist. Fish., ii, 1839, p. 248.

*Caranx poloosoo* Richardson, ibid., pl. lviii, figs. 4, 5.

*Gnathanodon speciosus* Bleeker, Nat. Tijds. Nederl. Ind., i, 1851, p. 160; id., ibid., ii, 1851, p. 471; id., ibid., iii, 1852, pp. 57, 236, 445; id., Verh. Batav. Gen., xxiv, 1852, Makreel., p. 72; id., ibid., xxv, 1853, Bengal, p. 46; id., Verh. Akad. Amsterdam, ii, 1855, van Diemensland, p. 10; id., Nat. Tijds. Nederl. Ind., viii, 1855, p. 344; id., ibid., xv, 1858, pp. 200, 223; id., ibid., xvi, 1859, p. 317; id., Act. Soc. Sci. Indo-Neerl., viii, 1860, Sumatra 1, p. 30 & 2, Celebes, p. 40; id., Nat. Tijds. Nederl. Ind., xxii, 1861, p. 65; id., Versl. Akad. Amsterdam, xii, 1861, p. 74; id., Nederl. Tijds. Dierk., i, 1863, p. 235; id., ibid., ii, 1865, pp. 191, 290; id., Versl. Akad. Amsterdam (2) ii, 1868, pp. 293, 300; id., in Pollen & van Dam, Faun. Madagascar, pt. 4, 1875, Poiss., p. 99; id., Verh. Akad. Amsterdam, xviii, 1879, Ile Maurice, p. 18; Jordan & Evermann, Fish. North & Mid. Amer., pt. 1, 1896, p. 928; Jordan & Richardson, Check-List Fish. Philipp. Archip., 1910, p. 21.

*Caranx panamensis* Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 166.

*Caranx edentulus* Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, pt. 4, Mar. 1877, p. 327, pl. xi, fig. 2.

*Caranx obtusiceps* Macleay, Proc. Linn. Soc. N. S. Wales, vii, pt. 3, 1882, p. 357.

*Caranx (Hypocaranx) speciosus* Klunzinger, Fisch. Roth. Meer., 1884, p. 96, Steindachner, Denk. Akad. Wien, lxx, 1900, p. 495.

*Caranx cives* de Vis, Proc. Linn. Soc. N. S. Wales, ix, pt. 3, 29 Nov. 1884, p. 540.

## KING TREVALLY.

GOLDEN TREVALLY; BANDED TREVALLY.

(Plate XXI.)

- Type localities*:—Red Sea at Jeddah (*S. speciosus*).  
 Red Sea at Jeddah (*S. rim*).  
 Red Sea at Suez (*C. plectaurista*).  
 Australia (*C. poloosoo*).  
 Pacific Coast of Panama (*C. panamensis*).  
 Percy Islands, M.Q. (*C. edentulus*).  
 Port Moresby, B.N.G. (*C. obtusiceps*).  
 Coast of North Queensland (*C. eives*).

Dorsal contour of body evenly rounded and more elevated than the ventral, which is sublinear and gently declivous between the throat and the origin of the anal fin, beyond which it is symmetrically acclivous; width of body 2.66 to 2 in its depth, which is 2.9 to 2.4 in its length and one eighth to one third more than the length of the head; abdominal region rather long, its length 1.4 to 1.55 in that of the anal; caudal peduncle from one half to one twelfth deeper than wide, its width 2.55 to 1.25 in the eye-diameter. Head large, with evenly convex upper profile, its length 3.35 to 3.15 in that of the body; width of head 2 to 1.8 in its depth, which is 1.2 to 1.05 in its length; cranio-nuchal keel moderately trenchant in the young, inconspicuous in the adult. Diameter of eye 3.6 to 5.4 in the length of the head, 1.33 to 2.25 in that of the snout, and 1.05 to 1.85 in the elevated and sharply convex interorbital width, the adipose lid not nearly reaching the pupil in front or behind. Mandible extending to below the anterior border of the pupil in the young, of the eye in the adult; maxillary rather shorter, its length 2.7 to 2.5 in that of the head, the width of its truncate or rounded distal extremity from one fourth more in the young to three fifths less in the adult than its distance from the eye and 2.05 to 1.55 in the eye-diameter. Angle of preopercle feebly crenulate.

No teeth, at least in the adult.<sup>13</sup>

<sup>13</sup> Day (1) remarks—"In young specimens several rows of villiform teeth in upper jaw, with an external row of strong ones; a single row of irregularly sized ones in the lower jaw; small and villiform on vomer and palate." This is practically the adult dentition of *Carangus* Griffith, which should, therefore, be closely associated with *Caranx* in the generic sequence. Richardson and Cantor also describe these teeth, the latter hazarding the statement that they have become imperceptible by the time the fish has attained a length of 90 millim. In our smallest example we can nowhere detect any teeth, thus corroborating Cantor's statement, nevertheless the sun-dried tongue of a large specimen is densely clothed with minute acicular teeth.

Posterior half of preorbital with some deeply imbedded mostly non-imbricate scales; middle portion of cheek, postorbital region, upper edge of opercle, and occiput scaly, the latter extending forward on the sides to above the middle of the eye; rest of the head and a gradually decreasing stripe along the occipital and nuchal ridges naked in the adult; scaly area much restricted in the young; preorbital and preopercle crossed by indistinct mucous canals; nuchal canal more conspicuous, extending among the scales to below the middle of the spinous dorsal. Lateral line moderately curved to below the eighth dorsal ray, the length of the curved section equal to one fifth less than that of the straight, which is weakly armed posteriorly with 10 to 18 feeble scutes, which increase in size and strength with age; widest scute in the adult about one third of the eye-diameter.

Dorsal fin with viii to v, i 19 to 21 rays; spinous dorsal small, originating a little behind the pectoral-base; procumbent spine exposed in the young only; spines feeble, the 2nd longest 2.55 to 3.45 in the length of the head, the three last becoming isolated and finally absorbed with increasing age. Soft dorsal originating a little nearer to the root of the caudal than to the tip of the snout, the anterior rays produced as a low falciform lobe, its height 7.8 to 6 in the length of the body, and extending when depressed to the 10th ray; last ray slightly produced. Caudal fin widely forked, the lobes equal, 4 to 3.4 in the length of the body. Anal fin with ii, i 16 or 17 rays, originating below the 6th or 7th dorsal ray; free spines short, the second the longer, 2.6 to 1.9 in the eye-diameter and 4 to 5.2 in the 1st ray, which is 2.33 to 2 in the length of the head, and extends when depressed to the 9th ray. Pectoral with 21 or 22 rays, its length 3.85 to 2.6 in that of the body, and from one seventh less to one fifth more than the length of the head, the 4th and 5th rays longest, extending in the young to above the origin, in the adult to above the 7th or 8th ray, of the anal. Ventral moderate, its length 2 to 2.8 in that of the pectoral and 8 to 7.25 in that of the body, the 1st ray a little the longest extending to a little beyond the vent.

Gill-rakers 19 to 21 on the lower branch of the anterior arch, the longest from one fifth more than to as long as the fringes and 5.2 to 7.4 in the length of the head. Vent situated from one sixth nearer to the anal than to the origin of the ventral in the young to one eighth nearer to the origin of the ventral than to the anal in the adult.

Coloration:—(*Young*): Golden, with ten or twelve alternately wide and narrow black cross-bands, which do not quite reach to the ventral edge of the trunk, but are complete on the tail; the first band runs obliquely forwards from the occipital ridge through the eye to close behind the maxillary; the second less obliquely backwards from the nuchal ridge over the hinder border of the opercle to the base of the pectoral, below which it curves slightly forwards on the breast; the third, fourth, and fifth<sup>14</sup> are below the spinous dorsal and are

<sup>14</sup> When but ten bands are present there are two only below the spinous dorsal.



subvertical; the remaining seven run vertically from the soft dorsal to the anal; between the seven anterior bands are still narrower and less conspicuous blackish bars or chains of spots, which do not descend below the level of the pectoral; a small, mostly concealed, black axillary spot; upper surface of snout washed with bronze. Fins greenish yellow, the first dorsal clouded; tips of the caudal lobes black. (*Half-grown*): At this stage the upper surface is golden brown, shading through the sides to the pearly white of the breast and abdomen; the supplementary bars have disappeared and the principal bands have faded to a dull blue and rarely extend below the middle of the sides; the snout has also become dull blue and there is a similar blotch on the opercle, the black tips of the caudal lobes have disappeared, but the tips of all the rays inside the fork are dusky. (*Adult*): Silvery, washed above with plumbeous blue and without any trace of bands or spots, only the yellowish tinge of the fins and the dusky tips of the spinous dorsal and caudal persisting. (*speciosus*, handsome or showy.)

Described from four Queensland examples, measuring 353, 323, 261, and 124 millimeters, the largest, from Moreton Bay, belonging to the Amateur Fishermen's Association of Queensland, the remaining three in the Queensland Museum from Darnley Island, Townsville, and Southport, having been respectively presented by Dr. J. R. Tosh, Mr. F. H. Taylor, and the writer.

*Vernacular names*:—As both of the names, by which this species is commonly known, refer to the coloration of the young fish only, we have found it necessary to create a name, which will be suitable to the fish at all stages of growth.

*Historical*:—This beautiful species was originally described from specimens obtained at Jeddah, on the Arabian Coast of the Red Sea, by Forskal, to whom it was known by the Arab name *rim*,<sup>15</sup> which, according to Valenciennes, signifies a staircase, and was doubtless suggested by the evenly graded bands on the sides of the fish. The next knowledge of importance came from Commerçon, who left in his MSS. a detailed description as well as a figure, both of which were subsequently published by Lacépède; his specimens, two in number, were taken at Mauritius, where he left the elder Bougainville, when on his way back to France after circumnavigating the globe in the frigate "Boudeuse," 1766 to 1769. Russell's figure, published a year later than Lacépède's from an example captured on the East Coast of India, does little credit to the artist and would be irrerecognisable were it not for the cross-bands.<sup>16</sup> Valenciennes adds little to our knowledge

<sup>15</sup> Being unable to consult Forskal's work I can not tell whether that author described the species twice—as *Scomber rim* and *S. speciosus*—as would appear from the synonymy given by Jordan and Evermann. No mention is made of any such species by Günther or Day, and I, therefore, follow Valenciennes in looking upon *rim* as an Arabic title only.

<sup>16</sup> Russell himself complicates matters by giving wrong measurements for his specimen, which, he says, was seven in. in length and three and one third in width (*i.e.* depth). The latter figure is doubtless a misprint for two and one third.

of the species, but he extends its range to Vanikoro,<sup>17</sup> the principal island of the Santa Cruz Group (notable as the place where the intrepid French navigator, La Perouse, met disaster and death), and New Holland, whence it was first obtained by Busseuil, the naturalist attached to the French Expedition in the "Thétis" and "Espérance" under the command of the younger Bougainville about 1825. Some time later Isidore Geoffroy St. Hilaire described the same species as new from a specimen taken at Suez. The next noteworthy feature of its history was the figuring by Richardson in 1848 of a very young specimen, measuring about 70 millim.; the transverse bands and caudal spots are well shown in this figure, but according to my observations the body is too deep and the head too large. Cantor, who followed him, gave a very accurate account of the colors of a 225 millim. example. The next year, 1851, is an interesting one in its history, for it was then Bleeker, rejecting the name *Caranx*, furnished it with a distinct generic title, *Gnathanodon*, a proceeding which, though followed by certain authors, chiefly American, is quite unnecessary, since Commerçon, the original creator of *Caranx*, directly associated the name with this fish; this, however, was entirely in accord with Bleeker's peculiar taxonomic methods. Bleeker mentions the species in no less than twenty-seven papers, but in not one of the nine to which we have access is there a description, nor need any of them concern us here save one published in 1855, in which he claims to have received a specimen from Tasmania; in this we are sure there is some error for, as we have had occasion to point out with regard to another species included therein, this trevally is a purely warm water form, and is not in any case likely, if there, to have been overlooked by such observers as Allport, Johnston, Kent, and others. Peters about the same time increased its range to Mozambique, while the next notable accession to its distribution came from the very opposite axis of its wanderings through Gill, who in 1863 described it as new from the Pacific Coast of Panama, a proceeding which was called in question some years later by Günther, who asserted the identity of *C. panamensis* with *C. speciosus*, in which opinion he was subsequently supported by Jordan and Gilbert. Meanwhile Playfair had added the Seychelles to its list. In 1877 the only definitely recorded Australian locality was Houtman's Abrolhos, W.A., referred to by Richardson but overlooked by Macleay, but in that year Alleyne and Macleay described it under a new name from the Queensland Coast, to which the junior author afterwards added Torres Strait and Port Moresby.

*Uses*.—Considering the large size and wide distribution of this fine fish information regarding its edible qualities is decidedly meagre. Cantor dismisses it with the remark that "they are eaten by the natives," which recalls to mind Pope's famous cynicism "damned with faint praise." Beyond this there is

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<sup>17</sup> Valenciennes, with admirable impartiality, refers to this island as Vanicolo or Vanikoro. My colleague, Mr. Douglas Ramaie, whose knowledge of the Western Pacific Islands is unequalled, assures me that they are one and the same.



absolute silence until Jordan and Evermann (1) report that it is "an excellent and valued food-fish." To its excellence we can ourselves bear witness.

*Range*:—Warmer parts of the Indian and Pacific Oceans. On the Queensland Coast it occurs from south to north, and has been specially recorded from Southport and Moreton Bay, S.Q. (*Ogilby*); Percy Islands, M.Q. (*Alleyne & Macleay* as *C. edentulus*); Cleveland Bay, N.Q. (*Klunzinger* and *Taylor*); Torres Strait (*Macleay*); and Darnley Island (*Tosh*). Other Australian localities are Houtman's Abrolhos (*Richardson*) and Fremantle (*Waite*), W.A. It has not yet been recorded from New South Wales, but the fact that it is by no means uncommon in Queensland waters suggests its presence on the Northern shores of the Mother State. With Tasmania's pretensions we have already dealt. Passing northward we find it recorded from Port Moresby, B.N.G., by Macleay. In the Malayan subregion, proceeding westward, Bleeker has reported it from Goram, Waigiu, Ceram, Ternate, Amboina, Celebes, Madura, Borneo, Biliton, Java, Thousand Islands, Banca, Bintang, Rio, Sunda, Singapore, Sumatra, and Tanara (which last I am unable to locate) and Cantor from Pinang. Jordan and Richardson extended its range still further north through the Philippines to Formosa; still again westward we find it inhabiting the seas of the Andamans, Ceylon, and the Indian Peninsula, and onward to the Seychelles, Mauritius, Madagascar, and Mozambique, till we finally take leave of it in this direction in the typical waters of the Red Sea. To the eastward, however, although it has forced its way through the Tropical Pacific apparently to its ultimate limit, its course is not so readily traceable; Günther makes no mention of it in the *Fische der Sudsee*, but Jordan and Seale record it from Samoa, Fiji, and the Hawaiian Archipelago, while others report it from the Pacific Coasts of Mexico (Cape San Lucas) and Panama, but of these latter we shall have some remarks to make further on.

*Dimensions*:—While the largest specimen of which we have any personal knowledge measured a little under 400 millim., the species attains a much greater size on the Indian Coast, whence specimens of 840 millim. have been recorded by Günther (1), and even up to 915 millim. by Day (1).

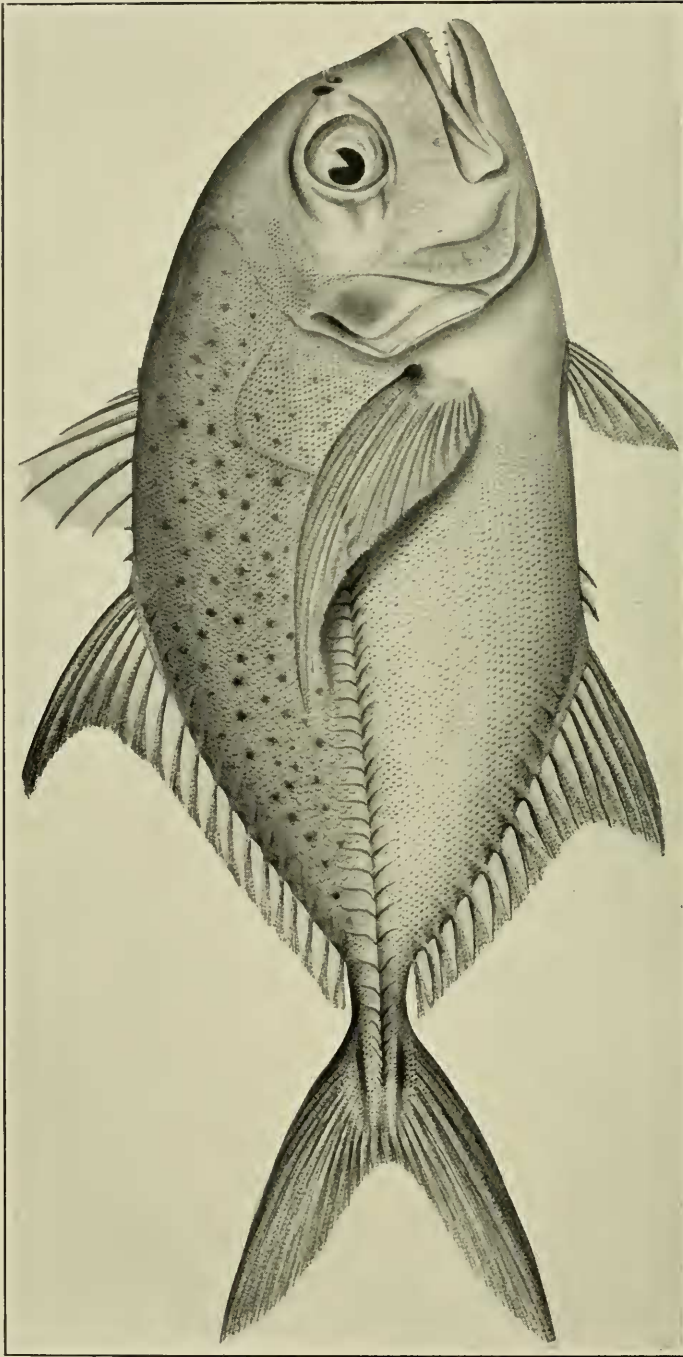
*Remarks*:—According to the description given by Jordan and Evermann (3) American examples differ from ours in several important characters. For instance the eastern form is much deeper, the depth of the body being 2.33 to 2 in its length in American and Hawaiian examples as against 2.9 to 2.4 in those from Australia and westward; the rule, however, is not without exceptions in both areas, for according to Gill's description the typical *C. panamensis* belongs to the slender form, while the typical *C. obtusiceps*<sup>18</sup> belongs to the deeper. Again the teeth in the young of the eastern fish are said to be granular, while in ours they are villiform. Lastly the beautiful color-pattern of the caudal fin,

<sup>18</sup> We have to thank Mr. McCulloch for kindly verifying our identification of this species with *C. speciosus*, by an examination of Macleay's type.









CARANGUS BUCCULENTUS (Alleyne & Macleay). ♂ Nat. Size.

Phyllis Clarke, del

which is so conspicuous in the young of the western form, is wholly lacking in the eastern. The segregation of the two forms under a varietal nomenclature may, therefore, be advisable; they would then stand as *Caranx speciosus speciosus* (Forsk.) and *C. s. obtusiceps* Macleay.

*Illustration*:—Our figure is taken from a Daruley Island specimen in the collection of the Queensland Museum. It measures 323 millim. and was the gift of Dr. J. R. Tosh. Reg. No. I. 13/1097.

#### CARANGUS BUCCULENTUS (Alleyne & Macleay).

*Caranx bucculentus* Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i. pt. 4, March, 1877, p. 326, pl. xi, fig. 1; Kent, Great Barrier Reef, 1893, App. A., p. 369.

*Caranx nobilis* Kent, *ibid.*, pl. xlvii, fig. 3. Not of Macleay 1881.

#### WIDE-MOUTHED TREVALLY.

(Plate XXII.)

*Type locality*:—Cape Grenville, N.Q.

Body ovate and compressed, the dorsal contour elevated and evenly rounded from the frontal region to the peduncle; ventral contour sublinear and slightly declivous from the chin to the anal, whence it rises somewhat abruptly to the peduncle; width of body 2.55 in its depth, which is 2.4 in its length and three tenths more than the length of the head; abdominal region long, its length 1.15 in that of the anal fin; depth of caudal peduncle 1.6 in its width, which is 1.25 in the eye-diameter. Head large, its length 3.1 in that of the body; width of head 1.85 in its depth, which is subequal to its length; cranio-nuchal keel little developed. Snout rather long, its profile linear and strongly acclivous to the level of the nostrils, above which there is an appreciable gibbosity, its length 3.05 in that of the head; eye large, with the adipose lid little developed, its diameter 3.8 in the length of the head and 1.25 in that of the snout; interorbital region broadly rounded, its width about one eighth more than the eye-diameter. Lower jaw projecting; maxillary extending to below the hinder border of the pupil, its length 2.75 in that of the head, the width of its distal extremity 1.5 in its distance from the eye and half of the eye-diameter. Angle of preopercle feebly crenulate.

Upper jaw with a broad band of villiform teeth and an outer row of enlarged widely set conical teeth; lower jaw with a single series of strong but rather smaller and more closely set teeth; no perceptible canines; small teeth on the vomer, palatines, pterygoids, and tongue, those of the former in a triangular patch.

Cheeks, temples, and upper edge of opercles scaly, the rest of the head, the nuchal ridge, and the breast naked; mucous canals of preorbital coarse, of preopercle fine, both rather sparsely branched; nuchal canal conspicuous,

extending into the scaly shoulder to below the procumbent spine. Lateral line strongly arched to below the 6th dorsal spine, the length of the eurved section 2.6 in that of the straight, which is armed throughout with 36 strongly keeled spinigerous scutes, the widest of which are below the last third of the soft dorsal and 1.33 in the eye-diameter; some of the spines on the peduncle exceptionally strong, upright, and recurved.

Dorsal fin with viii, i 18 rays; spinous dorsal well developed, originating above the base of the pectoral; procumbent spine strong and exposed; spines flexible, the 3rd longest, 2.75 in the length of the head, the last small and isolated. Soft dorsal originating about one eighth nearer to the root of the caudal than to the tip of the snout, the anterior rays produced as a falciform lobe, its length 4.7 in that of the body and extending when depressed to the 10th ray; last ray somewhat produced. Caudal fin deeply forked, the upper lobe the longer, 3.55 in the length of the body. Anal fin with ii, i 16 rays, originating below the 7th dorsal ray; free spines well developed, the 2nd the longer, 1.95 in the eye-diameter and 4.25 in the 1st ray, which is 1.75 in the length of the head and extends when depressed to the 10th ray. Pectoral with 19 rays, its length 2.85 in that of the body and about one twelfth more than that of the head, the 5th ray longest, extending to above the 5th anal ray. Ventral moderate, its length 2.35 in that of the pectoral and 6.7 in that of the body, the outer ray longest, extending to the vent.

Gill-rakers stout and rather long, 6+20 on the anterior arch, the longest about two fifths more than the gill-fringes and 5.65 in the length of the head. Vent situated one fourth nearer to the anal than to the origin of the ventral.

Upper surface pale olive green with or without blue spots,<sup>19</sup> sides silvery; abdomen, breast, and lower surface of head milk-white; a well marked black axillary spot, extending downwards to cover the posterior half of the pectoral-base; a large diffused dark spot on the upper half of the opercle. Fins pale yellowish green, the anterior border and outer half of the dorsal lobe and the extremity of the upper caudal lobe darker.<sup>20</sup> (*bucculentus*, having a large mouth.)

Described from a single specimen, 235 millim. in length, forwarded from Townsville by Mr. F. H. Taylor, Entomologist to the Institute of Tropical Medicine, to whom we hereby return our best thanks.

*Historical*:—Our earliest knowledge of this species was supplied by the naturalists of the "Chevert," who collected two specimens, measuring 207 and

<sup>19</sup> On our specimen all the body above the level of the straight part of the lateral line is closely blue-spotted.

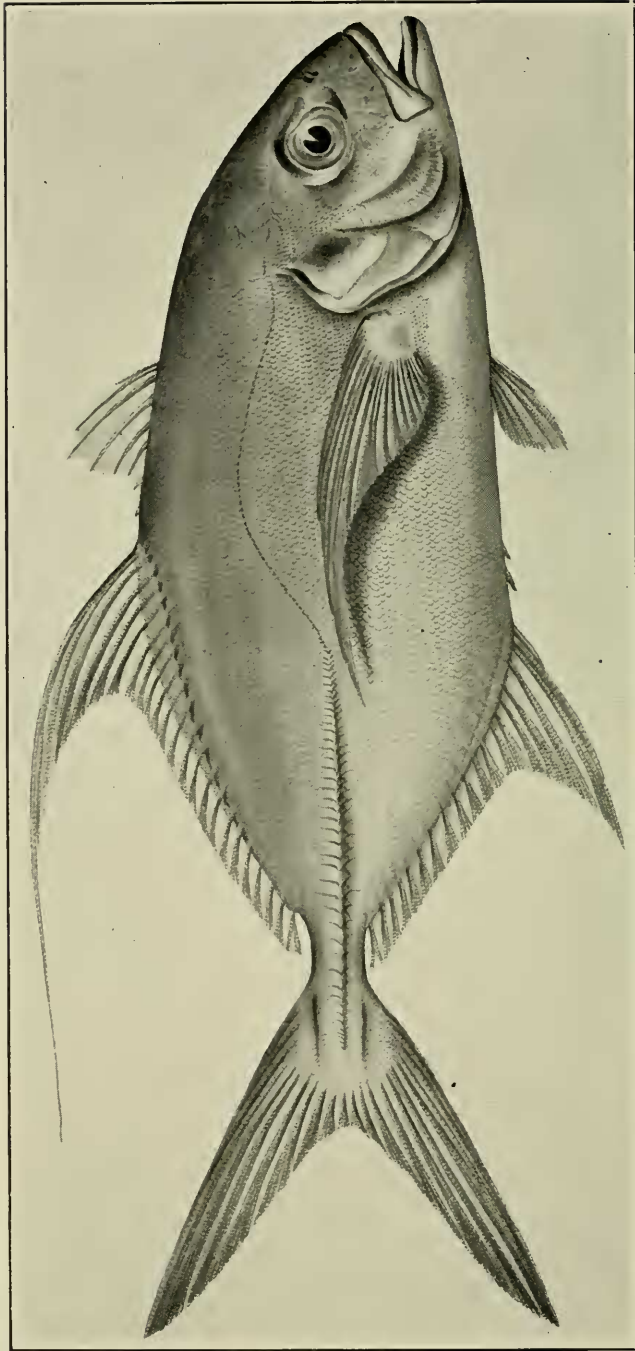
<sup>20</sup> McCulloch (*in lit.*) says—"My smallest specimen, 123 millim., has five broad, dark cross-bars descending from the back to the middle of the sides."











CIRULA GRACILIS Ogilby. ♂ Nat. Size.

Phyllis Clarke, del.







222 millim. (*vide* McCulloch *in lit.*) in the neighbourhood of Cape Grenville, N.Q., in 1875, these subsequently becoming the types of Alleyne and Macleay's species. From that time until quite lately this interesting trevally was wholly lost sight of, the only reference to it between 1877 and the present time being that in Kent's "Classified List of Queensland Food Fishes,"<sup>21</sup> a production of which the less said the better. Nevertheless Kent, though unknowingly, must have obtained specimens somewhere on the coast, since he publishes an unmistakable photograph of it on plate *xlvii* of the work referred to under the name of *Caranx nobilis* Macleay, a species to which it has not the remotest resemblance. During the second cruise of the F.I.S. "Endeavour" in Queensland waters this species was met with thrice, namely, at Pine Peak<sup>22</sup> 21 examples, off Cape Gloucester 6, and in Edgecumbe Bay 204 on a fine sand and mud bottom at a depth of from 25 to 14 fathoms.

*Range*:—East Coasts of Middle and South Queensland.

*Dimensions*:—To at least 235 millim.

*Illustration*:—Taken from the Townsville example referred to above. Reg. No. I. 13/1483.

**CITULA GRACILIS** sp. nov.

COACH-WHIP TREVALLY.

(Plate XXIII.)

*Type locality*:—Darnley Island.

Body deeply elliptical and compressed, the dorsal contour much more arched than the ventral and evenly rounded from the occiput to the peduncle; ventral contour feebly rounded and declivous to the ventral fins, between which and the anal it is slightly emarginate; width of body about half its depth, which is 3.05 in its length and one fifth more than the length of the head; abdominal region rather long, its length 1.35 in that of the anal fin; depth of caudal peduncle 1.35 in its width, which equals the eye-diameter. Head rather small, its upper surface from the tip of the snout to the nape linear and moderately acclivous, its length 3.66 in that of the body; width of head 1.7 in its depth, which is 1.1 in its length; cranio-nuchal keel little developed. Eye small, its diameter 4.05 in the length of the head, 1.35 in that of the snout; adipose lid not nearly reaching the pupil in front or behind; interorbital region convex, its width a little more than the eye-diameter. Lower jaw slightly projecting; maxillary extending to below the anterior border of the pupil, its length 2.6 in that of the head, the width of its distal extremity 1.25 in its distance from the eye and 2.05 in the eye-diameter. Membranous border of preopercle finely crenulate.

<sup>21</sup> See "Great Barrier Reef," Appendix A, pp. 369, 370.

<sup>22</sup> An outlier of the Percy Islands in lat. 21.5 S.

Villiform teeth in broad bands in the jaws, the outer series somewhat enlarged and widely set, in narrower bands on the palatines and tongue, and in a triangular patch on the head of the vomer.

Cheeks, temples, and upper part of opercles scaly, the rest of the head, the nuchal ridge, and the breast naked; preorbital and preopercle crossed by numerous mucous canals; nuchal canal indistinct, not nearly reaching to the dorsal. Lateral line gently curved to below the 9th dorsal ray, the length of the curved section 1.15 in that of the straight, which is armed throughout with 38 strongly keeled spinigerous scutes, the widest on the peduncle 2.3 in the eye-diameter.

Dorsal fin vi, i 21 rays; spinous dorsal moderate, originating well behind the base of the pectoral; procumbent spine concealed; spines flexible, 3rd longest, 2.2 in the length of the head. Soft dorsal originating midway between the tip of the snout and the root of the caudal fin, the anterior ray produced as a filiform appendage, extending when depressed to the end of the proximal third of the upper caudal lobe and 1.7 in the length of the body; 2nd ray one fifth shorter than the head, those behind it gradually decreasing to the 7th; last ray slightly produced. Caudal fin deeply and widely forked, the upper lobe the longer, 2.9 in the length of the body. Anal fin with ii, i 18 rays, originating below the 9th dorsal ray; free spines short and weak, the 2nd the longer, 2.15 in the eye-diameter and 8.7 in the 1st ray, which is slightly filamentous, as long as the head, and reaches when depressed to the 16th ray. Pectoral with 21 rays, its length 2.55 in that of the body and two fifths more than that of the head; 4th ray longest, extending to above the 5th anal ray. Ventral rather small; inserted behind the pectoral-base, its length 2.7 in that of the pectoral and 1.9 in that of the head; outer ray longest, reaching midway to the 3rd anal ray.

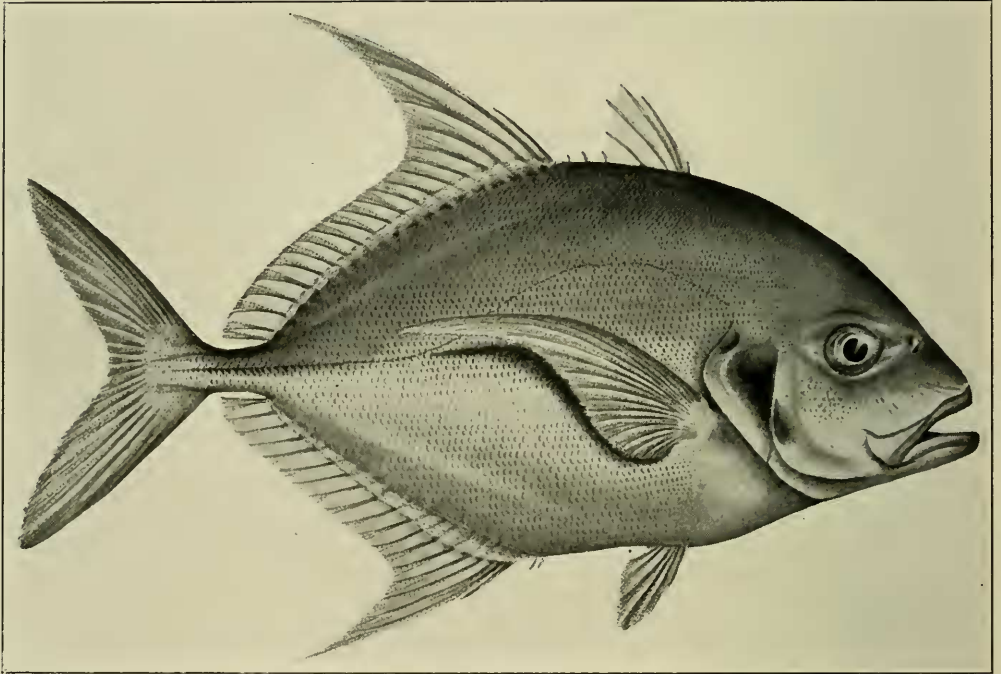
Gill-rakers stout and of moderate length, 5+19 on the anterior arch, the longest a little shorter than the gill-fringes and 7.5 in the length of the head. Vent midway between the origin of the ventral and the second free anal spine.

Upper surface pale olive green, shading into silvery on the sides; abdomen, breast, and lower surface of head milk-white; an obscure dusky spot behind the eye and another upon the opercle, the two connected by a narrow dark blue band, which is produced backwards below the lateral line to above the middle of the pectoral. Short rays of soft dorsal tipped with lavender; upper lobe of caudal dull violet tipped with blackish, lower grayish tipped with smoky brown; other fins colorless. (*gracilis*, slender.)

Described from a single example, 290 millim. long, presented to the Queensland Museum by Dr. J. R. Tosh, who obtained it at Darnley Island.

Reg. No. of type in the Queensland Museum—I. 13/1499.





CITULA CHRYSOPHRYS (Cuvier & Valenciennes).  $\frac{2}{3}$  Nat. Size.

*Phyllis Clarke, del.*